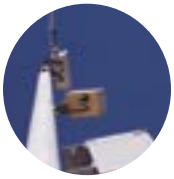
Intelligent Transportation Systems

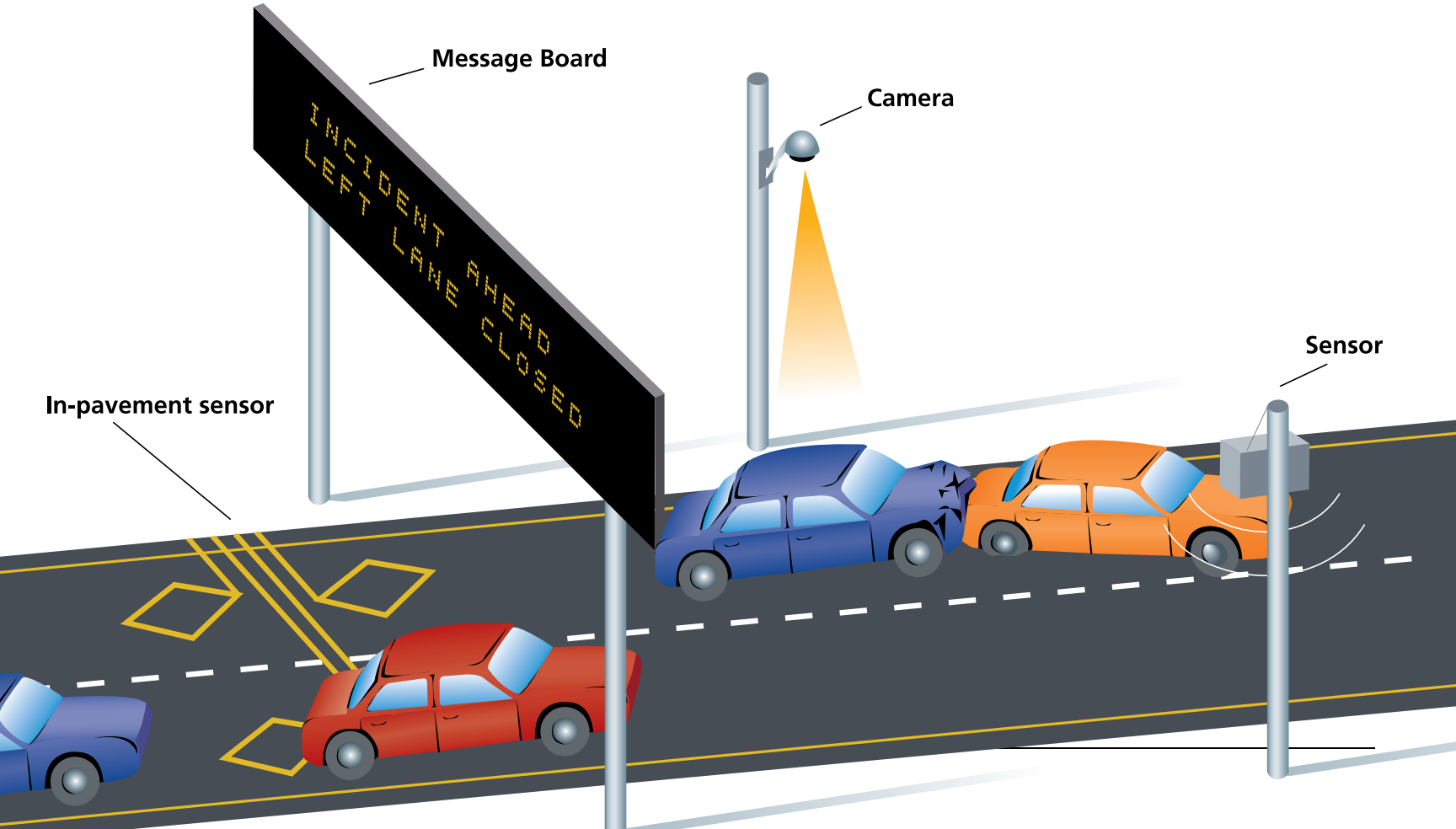


Traffic congestion, delays, breakdowns, jams and bottlenecks can tie knots in urban roadways. Helping cities and regions untangle the knots is part of the Missouri Department of Transportation's job. To get the job done right, state traffic engineers are turning to technology.

The concept of this technology is simple: know what's going on out there, fix problems when they arise and keep traffic flowing. By using cameras to "see" traffic patterns and special sensors to "feel" them, MoDOT is helping manage traffic and straighten tangled routes.

Intelligent Transportation Systems have been successful in numerous locations across the country. Now Missouri's three largest metropolitan areas are starting to make their highways and interstates smarter. While the hardware is similar for all three, their strategies and approaches are somewhat different.

Here's a look at how Missouri is implementing Intelligent Transportation systems in Kansas City, St. Louis and southwest Missouri.



Kansas City Scout
Smart Highways in Kansas City

By Dianna Lopez

The face of Kansas City's major metropolitan freeways is about to change forever. The change will mean safer roads, less air pollution and less time stuck in traffic.

You may have already heard about "smart highways." If you have, you've got an understanding of Kansas City Scout.

These highways are "smart" because they're equipped with monitoring devices like roadway sensors and cameras that gather information about traffic conditions. That information is used to tell drivers what to expect on the freeways.

Think about it. Smart highways foster smart drivers. If you knew ahead of time your route had a 45-minute delay, you'd probably decide to go a different way. If you couldn't do that, you'd at least have the information to call to say you'll be late. Knowing what to expect helps you know how to react.

Right now, crews are placing elements of the $35-million Kansas City Scout system along some of Kansas City's major metropolitan highways. They began work on the project in September 2001 digging trenches, laying fiber-optic cable, and building a state-of-the-art operations center in Lee's Summit.

Soon Scout will blanket 75 miles of continuous roadway in Kansas and Missouri with 75 cameras, thousands of traffic sensors, and dozens of huge electronic message boards to alert drivers to traffic snarls. Before the end of this year, you'll see some of Kansas City's interstates – including portions of Interstates 35, 435, 70 and 670 – look like you've never seen them before.

Scout will use cameras and sensors to monitor roadways and look for trouble spots such as accidents, stalled cars, dead animals in the road, or anything that would affect traffic flow.

Once a problem is spotted, Scout operators will launch a comprehensive response that could include dispatching Motorist Assist. Operators can help a stranded motorist by verifying incident information with emergency services, helping them respond more quickly and efficiently.

Operators also respond with information. They can use Scout's new electronic signs to warn drivers about problems ahead. They can also broadcast urgent traffic information on an improved Highway Advisory Radio (station 1610 AM), send vital information to the media and update Scout's web site at *www.kcscout.net* with urgent traffic information.

Also, sometime after the system becomes fully operation at the end of this year, web site users will be able to check out traffic for themselves by clicking on any of Scout's 75 cameras.

Although Scout will be new to Kansas City, systems like it have been in place for years. California, Minnesota, Texas and Arizona have had great success with similar measures. Officially known as Intelligent Transportation Systems, or ITS, they've demonstrated reductions in rush-hour accidents by as much as 27 percent and improved rush-hour speeds by up to 35 percent while increasing the number of cars on the highway by 18-22 percent.

So how is it possible to have more cars traveling on the freeway at a faster pace and still have fewer accidents? It's all about flow. The more you can keep the traffic flowing freely, the faster it's able to travel. That allows the highway to accommodate more vehicles.

In a nutshell, that's what Scout's about: creating a safer highway environment by improving traffic flow. Accidents are still going to happen. But with Scout, the duration of the incident and the number of drivers impacted will be considerably reduced.

That's a lot to expect from one system, and Scout intends to deliver. What you shouldn't expect from Scout is law enforcement – no videotaping speeders, aggressive drivers, high-speed chases or gruesome accidents. Scout's purpose is traffic management, and Scout's success is your safety.

Dianna Lopez is Kansas City Scout communications director.

Kansas City Scout crews hang the first of several message boards along the 75-mile project.

PHOTO AT TOP BY CATHY MORRISON; BOTTOM BY KIM KOSSMANN

St. Louis *Gateway to Better Information, Smarter Travel*

By Tom Miller

One day after the infamous events of Sept. 11, 2001, the nation literally came to a stand still. Security alerts went up and all commercial air traffic was grounded for over a week. This included all air-mobile traffic-reporting sources.

This is relevant to the St. Louis area because on Sept. 10, MoDOT crews at St. Louis' Transportation Information Center received its first images from the roadside traffic cameras. It was from five cameras only, but to the traffic reporters (contracted by MoDOT to run the information center) and the public it served, it was invaluable. Aside from ground-mobile sources, these five cameras were literally the only eyes in the sky on traffic.

Over the course of the next 16 months, the traffic helicopters returned to the sky with the St. Louis district expanding on the operation of those few traffic cameras to have a fully functioning intelligent transportation program called Gateway Guide. Gateway Guide is a cooperative effort between MoDOT, the Illinois Department of Transportation, Metro Transit Agency, and the East-West Gateway Coordinating Council aimed at improving traffic flow, safety and transportation efficiency throughout the St. Louis Metropolitan area.

The technology backbone is now in place to provide commuters with real-time traffic reports and roadside messaging. *Gatewayguide.com* a real-time traffic information web site with online traffic camera feeds and live media tie-in to the cameras is also up and running.

In addition to providing information to the traveling public to avoid problem areas, Gateway Guide speeds the clearing of obstructions (accidents, debris, stalled vehicles) that cause traffic to back-up. In periods of peak traffic congestions, for every minute a lane is blocked on a busy highway, 20 minutes of backup may occur.

Gateway Guide utilizes the latest in Intelligent Transportation Systems technology, such as dynamic and portable message boards, which carry messages about serious traffic conditions; closed-circuit cameras for monitoring incidents; traffic sensors for monitoring traffic speeds and volumes; and in the future, ramp meters for regulating traffic flow from highway entrance ramps onto interstates. These technologies and the essential support of Motorist Assist and Emergency Response crews who help clear the lanes of obstructions and incidents, make up the Gateway Guide program.

In August 2002, three television stations tied into the Gateway Guide cameras to expand its morning traffic reporting ability. This agreement with MoDOT and local television affiliates allows MoDOT to broadcast traffic information via images to literally tens of thousands of viewers every morning. The traffic reporters that are supplied information from the center itself are also becoming more reliable with the information being up to the second.

In late 2002, the Gateway Guide program also became a part of the St. Louis Area Regional Abduction Alert program called S.A.R.A.A. This is the St. Louis area's version of the popular AMBER alert network that focuses on disseminating information on missing children. Gateway Guide helps by placing messages on the roadside message boards that state "Abduction Alert – Tune to your local radio station." Since the local radio stations are all participants in the program, they inform the general public of the details of the missing child. Since its inception, the S.A.R.A.A alert has been activated three times in the metro area, and MoDOT and Gateway Guide participated in one alert that ended happily.

One of the largest changes to the Metro St. Louis District and Gateway Guide's operations was by going to a 24-hour a day, seven day a week operation in January 2003. MoDOT Customer Service representatives and Gateway Guide operators now staff the Transportation Information Center through all holidays, weekends and into the early mornings. This is to assure that incidents can be coordinated through a centralized source, that source being MoDOT's Customer Service, Gateway Guide and its staff.

The future for Gateway Guide includes more monitoring devices online, a 511 traffic information hotline and live camera feeds in the form of still frame shots to *www.gatewayguide.com*. Along with the Kansas City, Branson and more than 70 other metropolitan areas that have programs like Gateway Guide, St. Louis is experiencing the future of transportation first hand.

Tom Miller is an outreach specialist at MoDOT's St. Louis Area District.

PHOTOS THIS PAGE BY MIKE WRIGHT. PHOTOS OPPOSITE PAGE: TOP BY CATHY MORRISON, BOTTOM FROM MODOT ARCHIVES

Southwest Missouri ITS *Leads the Way*

By Matt Hiebert

The Southwest Missouri Regional Traffic Management System is the grandfather of the state's Intelligent Transportation System.

The southwest version of ITS is a joint effort between the Missouri Department of Transportation and the cities of Springfield and Branson. Based in Springfield, the system has been evolving for six years.

"The Springfield/Branson area has always led the way for Missouri's ITS," says Matt Seiler, traffic engineer for MoDOT's Springfield Area District. "We had the first functional Traffic Management Center and the only operational system for several

years, which was the Branson Travel and Recreation Information Program." For Springfield, ITS began about the same time Branson TRIP was starting. MoDOT and the city of Springfield are working to merge the two systems.

In Springfield, ITS consists of a network of traffic cameras mounted at strategic locations around the city.

"Right now we have 26 cameras placed at major intersections, like Glenstone and Chestnut Expressway," Seiler says. "They cover most of Springfield's major streets and intersections."

City and MoDOT staff members review images from the cameras looking for congestion, stalled cars and accidents – anything that might tie up traffic.

"We have a Traffic Management Center at the Discovery Center downtown, which is owned by the city," Seiler says. "We have staff that monitors and reviews the images coming in from the cameras. We also have a feed coming into the district office so we can see what's going on."

In tourist-rich Branson, TRIP has been helping motorists plan their routes for several years. TRIP integrates a sensor system that monitors traffic movement and includes a camera network.

"What Branson has is largely an advanced traveler-information system," Seiler explains. "More than anything, it puts info out to visitors. We have four cameras and 16 detectors in the Branson area."

The data can be useful in areas beyond traffic control.

"That information can be used to develop a correlation between tax revenue and the number of visitors in the area," Seiler says, helping the city plan the use of tax dollars before the revenues arrive.

Getting information out to the driving public is Branson TRIP's primary job. To do this, data gathered from sensors and cameras is sent to various information outlets –permanent message boards, a continually updated 1610 AM radio frequency and an interactive telephone line.

Equally important, this information is sent to the Branson TRIP web site where it can be accessed by anyone with an online computer.

If a visitor is concerned about work zones, he or she can go to the site and see a map of the Springfield/Branson area. On the map several construction icons are placed near corresponding work zones. A viewer then can click on the icon and get information on the type of construction being done and its impact on traffic.

Visitors also can pick up the latest weather conditions for the Branson area on the TRIP web site.

Perhaps the greatest help offered by TRIP is up-to-minute traffic conditions. By using information automatically supplied by traffic sensors the computer can evaluate traffic density and speed and update the web site with immediate conditions.

Law enforcement and emergency responders also can update information outlets and take other action if necessary.

The Branson police department can enter an incident report into the computer and it will automatically update the radio message, phone system and message boards all from one spot.

In the future, it is hoped that more southwest Missouri communities will become involved with ITS, Seiler says. The fiber-optic hardware is in place and designed for expansion. A regional system would include several growing towns between Springfield and Branson.

"A person will be able to look at the whole area and make informed decisions on a larger scale, no matter which community the person will be driving in or through," Seiler says. ■

Matt Hiebert is editor of Pathways *and an outreach specialist at MoDOT General Headquarters.*